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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/897,042 | 07/03/2001 | Rudolf Valenta | 1614-0251P | 5581 |

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| EXAMINER |
|---|
| JAMROZ, MARGARET E |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1644 | 7 |

DATE MAILED: 01/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/897,042 | VALENTA ET AL. | |
| | Examiner | Art Unit | |
| | Margaret E Jamroz | 1644 | |

*-- The MAILING DATE of this communication appears on the cover she t with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *02 November 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-6,8,9 and 14-24* is/are pending in the application.

4a) Of the above claim(s) *8,9,14-20,23 and 24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,21 and 22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *31 July 2001* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *08/998,549* .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

## DETAILED ACTION

1. Applicant's amendment, filed November 2, 2001 (Paper No. 6), is acknowledged.
Claims 1-6, 8-9, and 14-24 are pending.

Applicant's election with traverse of Group I (claims 1-6 and 21-22) in Paper No. 5 is acknowledged. The traversal is on the ground(s) that examination of all three groups does not represent an undue burden. This is not found persuasive because even though Groups I and III share the same classification, section 6 of Paper No: 3 indicates that the immunogen of Group I can be used in other methods, thereby making Groups I, II, and III distinct inventions. Therefore, even though they the classification is shared, a different field of search would be required based upon the structurally distinct products recited and the various methods of use comprising distinct method steps. Additionally, arguments that a group consists of "only 2 claims" is not considered persuasive as the groups are classified differently.
The requirement is still deemed proper and is therefore made FINAL.

Claims 8-9, 14-20, and 23-24 are withdrawn from further consideration by the Examiner, 37 C.F.R. § 1.142(b) as being drawn to a non-elected invention.

Claims 1-6 and 21-22 are under consideration in the instant application.

2. The proposed drawing corrections and/or the proposed substitute sheets of drawings, filed on July 31, 2001, have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

3. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:
An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)). The specification on page 1 should be amended to reflect the relationship between application number 08/998,549 and the instant application.

4. Applicant's IDS, filed 7/3/2001 (Paper No. 4), is acknowledged.

5. The disclosure is objected to because of the following informalities: the material submitted on pages 22-23 looks like drawing material instead of text material. The examiner recommends cancellation of pages 22-23.
Appropriate correction is required.

6. Claim 2 is objected to because of the following informalities: in line 1, "immogen" should be "immunogen". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the **second** paragraph of 35 U.S.C. 112.

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-6 and 21-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Regarding claim 1, the phrase "partly but not wholly overlapping" in lines 4-5 renders the claim because the term is not defined within the claim. It is unclear how many amino acids of the IgG and IgE epitopes must overlap.

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 1-6 and 21-22 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an immunogen derived from Betv1 comprising a monomer or polymers consisting of a di-peptide connected via an tri-peptide linker comprising SEQ ID NOS: 19-21, does not reasonably provide enablement for an immunogen derived from **any** protein antigen comprising **any** fragment of **any** size connected via an oligopeptide linker of length other than three peptides. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

Applicant has not provided sufficient structural information (e.g. fragment length, sequence, etc.) that distinctly identifies such "fragments" other than those encompassed by the specific agents set forth in SEQ ID NOS: 19-21. While "non-anaphylactic fragments" may have some notion of the activity of the "fragments", claiming molecules by such properties fails to provide sufficient guidance and direction as to how the skilled artisan can make and use such "non-anaphylactic fragments", commensurate in scope with the claimed invention.

It has been well known to those skilled in the art at the time the invention was made that minor structural differences among structurally related compounds or compositions can result in substantially different pharmacological activities. Applicant has not enabled structurally related and unrelated compounds comprising "any fragment" containing an IgG epitope "partly but not wholly overlapping an IgE epitope wherein the fragment is non-anaphylactic which would be expected to have greater differences in their activities. It is known in the art that even single amino acid changes or differences in a proteins amino acid sequence can have dramatic effects on the protein's function. For example, Mikayama et al. (PNAS, 1993. 90: 10056-10060) teach that the human glycosylation factor (GIF) protein differs from human macrophage migration inhibitory factor (MIF) by a single amino acid residue (see Figure 1 in particular). Yet, Mikayama

et al. further teach that GIF is unable to carry out the function of MIF and MIF does not demonstrate GIF activity (see Abstract in particular).

There is insufficient direction or objective evidence as to how to make and to how to use **any** fragment derived from **any** protein antigen which is a non-anaphylactic immunogenic recombinant fragment for the number of possibilities associated with the myriad of direct and indirect effects associated with various molecules and, in turn, as to whether such a desired effect can be achieved or predicted, as encompassed by the claims.

Reasonable correlation must exist between the scope of the claims and scope of enablement set forth. Without sufficient guidance, the changes which can be made in the structure of any protein antigen fragment and still provide or maintain sufficient or the claimed activity is unpredictable, and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue.

In view of the quantity of experimentation necessary, the limited working examples, the unpredictability of the art, the lack of sufficient guidance in the specification, and the breadth of the claims, it would take undue trials and errors to practice the claimed invention.

12. Claims 1-6 and 21-22 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant is in possession of three immunogens consisting of the SEQ ID NOS: 19-21 wherein the immunogens are fragments consisting of di-peptide units separated by tri-peptide linkers and the immunogen is derived from a single protein antigen, Betv1.

Applicant is not in possession of any Betv1 fragment other than a di-peptide, of a polymner with more than four monomeric units, any oligopeptide linker with a length other than three peptides, or of any immunogen derived from any other protein allergen other than Betv1.

Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the written description inquiry, whatever is now claimed." (See page 1117.

The specification fails to define any immunogen or any protein allergen other than Betv1. The lack of sufficient limitations would therefore allow for all other allergens of trees, grasses, molds, animals, foods, etc. Therefore, the skilled artisan cannot envision all the contemplated allergen/immunogen possibilities recited in the instant claims. Adequate written description requires more than a mere statement that it is part of the invention. The sequence itself is required. A description of a genus of polypeptide sequences may be achieved by means of a recitation of a representative number of polypeptide sequences, defined by amino acid sequence, falling within the scope of the genus, or of a recitation of structural features common

to the genus, which features constitute a substantial portion of the genus. Regents of the University of California v. Eli Lilly&Co., 119F3d 1559, 1569, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997).

Applicant is directed to the Guidelines for the Examination of Patent Applications Under the 35 U.S.C. 112, ¶ 1 "Written Description" Requirement, Federal Register, Vol. 66, No. 4, pages 1099-1111, Friday January 5, 2001.

***Claim Rejections - 35 USC § 102 and Claim Rejections - 35 USC § 103***

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 1-2, 4, and 6 are rejected under 35 U.S.C. ' 102(b) as being anticipated by Vrtala et al., (J. Allergy Clin Immunology 1996 Nov; 98(5Pt1): 913-21).

Vrtala et al. teach a **dimeric** (2) form of **recombinant** Betv2, wherein said protein has an IgG epitope but is not reactive with IgE in 4 out of 6 animals injected with the recombinant protein (see Fig 3, in particular). In addition Vrtala et al. teach that polymeric forms of allergens are known to reduce the allergenicity of the allergen (see abstract, in particular). Furthermore, the recombinant Betv2 protein was injected with PBS (a **carrier**) and elicited a very low to no detectable IgE response in the animals injected (see Fig. 4, in particular). Since an IgE response is required for an anaphylactic shock to allergen to occur, and the dimerized recombinant Betv2 showed little to no detectable IgE response in vivo, the recombinant Betv2 protein would be considered a non-anaphylactic immunogen. Lastly, since Applicant's claims recite and immunogen comprising, the claim can read on an intact protein.

The prior art teachings anticipate the claimed invention.

16. Claims 1-2, 4, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Rogers et al. (Molecular Immunology, 1994; 31(13): 955-966).

Rogers et al. teach recombinant proteins comprised of peptides containing recombined T cell epitopes which exhibit reduced IgE binding (i.e. non-anaphylactic; see the Abstract in particular). Further, Rogers et al. teaches that human T cell epitope maps of important allergens have been defined, including Betv1, (see page 955, column 2). Figure 1 depicts the recombinant polypeptide, Figure 4, depicts IgE binding, and Figure 7 depicts tolerization with the recombinant polypeptide. The approach is applicable to allergen such as Betv1 (see the Discussion in particular). The recombinant polypeptides were injected into mice in PBS (i.e. a carrier; see page 960, left column, middle section).

The prior art teachings anticipate the claimed invention.

17. Claims 1-2 and 4-5 are rejected under 35 U.S.C. 102(b) as anticipated by Ebner et al. (J Immunology 1993 Feb; 150: 1047-1054).

Ebner et al. teach **recombinant Betv1 peptides** (i.e. fragments) in PBS (i.e. **carrier**), wherein the peptides elicit a T cell response (i.e. are immunogenic) but are not IgE epitopes (see page 1050, in particular).

Although the reference is silent about the peptides containing an IgG epitope partly but not wholly overlapping an IgE epitope, it does not mean that the reference peptide does not elicit an IgG response. Since the office does not have a laboratory to test the reference peptides, it is applicant's burden to show that the reference peptides do not contain an IgG epitope partly but not wholly overlapping an IgE epitope as recited in the claims. See In re Best, 195 USPQ 430, 433 (CCPA 1977); In re Marosi, 218 USPQ 289, 292-293 (Fed. Cir. 1983); In re Fitzgerald et al., 205 USPQ 594 (CCPA 1980).

18. Claims 1-2 and 4-5 are rejected under 35 U.S.C. 102(a) as anticipated by Vrtala et al. (J. Clin. Invest. 1997 April; 99(7): 1674-1681).

Vrtala et al. teach **recombinant Betv1 peptides** in sodium chloride solutions (i.e. **carrier**), that are non-anaphylactic and don't recognize IgE (see abstract and page 1674, in particular)

Although the reference is silent about the peptides containing an IgG epitope partly but not wholly overlapping an IgE epitope, it does not mean that the reference peptide does not elicit an IgG response. Since the office does not have a laboratory to test the reference peptides, it is applicant's burden to show that the reference peptides do not an IgG epitope partly but not wholly overlapping an IgE epitope as recited in the claims. See In re Best, 195 USPQ 430, 433 (CCPA 1977); In re Marosi, 218 USPQ 289, 292-293 (Fed. Cir. 1983); In re Fitzgerald et al., 205 USPQ 594 (CCPA 1980).

19. Claims 3 and 21 are rejected under 35 U.S.C. 103 as being unpatentable over Vrtala et al. (J. Allergy Clin Immunology 1996 Nov; 98 (5Pt1): 913-921) or Rogers et al. (Molecular Immunology, 1994; 31(13): 955-966), in view of U.S. Patent 4,629,783.

Vrtala et al. and Rogers et al. have been discussed supra. The claimed invention recited in claims 3 and 21 differs from the prior art teachings by the recitation of using a peptide linker to form the polymer. However, the '783 patent teaches the addition of one or two amino acids to the termini of oligopeptides to provide in the ease of linking peptides one to another (see column 3 in particular).

One of ordinary skill in the art at the time the invention was made would have been motivated to use peptide linkers to polymerize a protein, as taught by the '783 patent because polymerized allergens show reduced allergenicity as taught by Vrtala et al. and Rogers et al. and the addition of amino acids to the termini of peptides provides for an easy way of linking peptides to each other as taught by the '783 patent. From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole is prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references.

20. Claims 1-2 and 4-6 are rejected over Vrtala et al. Vrtala et al. (J. Clin. Invest. 1997 April; 99(7): 1674-1681) in view of U.S. Patent 4,269,764.

Vrtala et al. has been discussed supra. Vrtata et al. also teaches that Betv1 represents a major allergen of birch pollen inducing specific IgE antibodies in more than 95% of patients allergic to birch pollen (see page 1673 in particular). The claimed invention recited in claims 2 and 6 differs from the prior art teachings by the recitation of polymerizing the allergen. However, the '764 patent teaches that polymerization of allergens produces immunogenic allergens that have markedly reduced allergenicity (column 1-2 in particular). The markedly reduced allergenicity of the polymerized allergen would have the expected property of being non-anaphylactic, since a heightened allergic response is a prerequisite of allergen mediated anaphylaxis.

One of ordinary skill in the art at the time the invention was made would have been motivated to polymerize the recombinant Betv1 allergen, as taught by the '764 patent because polymerized allergens show reduced allerginicity as taught by the '764 patent and choose Betv1 to polymerize because Betv1 represents a major allergen of birch pollen inducing specific IgE antibodies in more than 95% of patients allergic to birch pollen, as taught by Vrtala et al. From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole is prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references.

21. Claims 3 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vrtala et al. (J. Clin. Invest. 1997 April; 99(7): 1674-1681) in view of U.S. Patent 4,269,764 as applied to claims 1, 2, 4, and 6 above, and further in view of U.S. Patent 4,629,783.

Vrtala et al. and the '764 patent have been discussed supra. The claimed invention differs from the prior art teachings by the recitation of using a peptide linker to form the polymer. However, the '783 patent teaches the addition of one or two amino acids to the termini of oligopeptides of one or two amino acids to provide in the ease of linking peptides one to another (see column 3, in particular).

One of ordinary skill in the art at the time the invention was made would have been motivated to use peptide linkers to polymerize the Betv1 peptide, as taught by the '783 patent because polymerized allergens show reduced allergenicity as taught by the '764 patent, and the addition of amino acids to the termini of peptides provides for an easy way of linking peptides to each other as taught by the '783 patent. From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole is prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references.

22. Claims 1, 2 and 6 are rejected under 35 U.S.C. ' 103 as being unpatentable over Ebner et al., (J Immunology 1993 Feb; 150: 1047-1054), in view of U.S. Patent 4,269,764.

Ebner et al., has been discussed supra. Ebner et al., also teaches that Betv1, the major allergen of birch pollen, is an important allergen causing symptoms in tree pollen-allergic individuals in the flowering season in early spring. The claimed invention recited in claims 2 and 6 differs from the prior art teachings by the recitation of polymerizing the allergen. However, the '764 patent teaches that polymerization of allergens produces immunogenic allergens that have markedly reduced allergenicity (column 1-2, in particular). The markedly reduced allergenicity of the polymerized allergen would have the expected property of being non-anaphylactic, since a heightened allergic response is a prerequisite of allergen mediated anaphylaxis.

One of ordinary skill in the art at the time the invention was made would have been motivated to polymerize the recombinant Betv1 allergen, as taught by the '764 patent because polymerized allergens show reduced allergenicity as taught by the '764 patent and chose Betv1 to polymerize because Betv1, the major allergen of birch pollen, is an important allergen causing symptoms in tree pollen-allergic individuals in the flowering season in early spring, as taught by Ebner et al. From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole is prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references.

23. Claims 3 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebner et al., (J Immunology 1993 Feb; 150: 1047-1054) in view of U.S. Patent 4,269,764, as applied to claims 1, 2 and 6 above, and further in view of U.S. Patent 4,629,783.

Ebner et al. and the '764 patent have been discussed supra. The claimed invention differs from the prior art teachings by the recitation of using a peptide linker to form the polymer. However, the '783 patent teaches addition of one or two amino acids to the termini of oligopeptides to provide in the ease of linking peptides one to another (see column 3, in particular).

One of ordinary skill in the art at the time the invention was made would have been motivated to use peptide linkers to polymerize the Betv1 peptide, as taught by the '783 patent because polymerized allergens show reduced allergenicity as taught by the '764 patent, and the addition of amino acids to the termini of peptides provides for an easy way of linking peptides to each other as taught by the '783 patent. From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole is prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references.

24. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ebner et al., (J Immunology 1993 Feb; 150: 1047-1054) or Vrtala et al. (J. Clin. Invest. 1997 April; 99(7): 1674-1681) in view of U.S. Patent 4,269,764 and U.S. Patent 4,629,783 as applied to claim 21 above, and further in view of U.S. Patent 6,126,939.

Ebner et al., Vrtala et al, and the '764 and '783 patent have been discussed supra. The claimed invention differs from the prior art teachings by using a peptide linker that is hydrophilic. However, the '939 patent teaches immunogens comprising polymers of peptides linked by a hydrophilic oligopeptide linker (i.e. "a short stretch of alanine residues" which are hydrophilic) to treat or ameliorate inflammation associated with allergic reactions; see column 9, paragraphs 2-4; and column 11, paragraph 2 in particular).

One of ordinary skill in the art at the time the invention was made would have been motivated to use peptide linkers to polymerize a protein using hydrophilic amino acids, as taught by the '939 patent because the polymerized allergens show reduced allergenicity as taught by Ebner et al. and Vrtala et al. and the addition of amino acids to the termini of peptides provides for an easy way of linking peptides to each other as taught by the '783 patent. From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole is prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references.

25. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vrtala et al. (J. Allergy Clin Immunology 1996 Nov; 98 (5Pt1): 913-921) or Rogers et al. (Molecular Immunology, 1994; 31(13): 955-966) in view of U.S. Patent 4,629,783 as applied to claim 21 above, and further in view of U.S. Patent 6,126,939.

Vrtala et al., Rogers et al. and the '783 patent have have been discussed supra. The claimed invention differs from the prior art teachings by using a peptide linker that is hydrophilic. However, the '939 patent teaches immunogens comprising polymers of peptides linked by a hydrophilic oligopeptide linker (i.e. "a short stretch of alanine residues" which are hydrophilic) to treat or ameliorate inflammation associated with allergic reactions; see column 9, paragraphs 2-4; and column 11, paragraph 2 in particular).

One of ordinary skill in the art at the time the invention was made would have been motivated to use peptide linkers to polymerize a protein using hydrophilic amino acids, as taught by the '939 patent because the addition of amino acids to the termini of peptides provides for an easy way of linking non-anaphylactic peptides as taught by Vrtala et al. and Rogers et al. to each other as taught by the '783 patent. From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole is prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references.

26. No claim is allowed.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Megan Jamroz, whose telephone number is (703) 308-8365. The examiner can normally be reached Monday to Friday from 8:00 to 4:30. A message may be left on the examiner's voice mail service. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Chan can be reached at (703) 308-3973. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center 1600 receptionist whose telephone number is (703) 308-0196.

Papers related to this application may be submitted to Technology Center 1600 by facsimile transmission. Papers should be faxed to Technology Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CM1 Fax Center telephone number is (703) 305-3014.

Margaret (Megan) Jamroz, Ph.D.
Patent Examiner
Technology Center 1600
January 11, 2002

Christina Chan

CHRISTINA Y. CHAN
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